

Title (en)  
BATTERY MODULE, BATTERY PACK, ELECTRICAL APPARATUS, AND MANUFACTURING METHOD AND DEVICE FOR BATTERY MODULE

Title (de)  
BATTERIEMODUL, BATTERIEPACK, ELEKTRISCHES GERÄT SOWIE VERFAHREN UND VORRICHTUNG ZUR HERSTELLUNG EINES BATTERIEMODULS

Title (fr)  
MODULE DE BATTERIE, BLOC-BATTERIE, APPAREIL ÉLECTRIQUE ET PROCÉDÉ ET DISPOSITIF DE FABRICATION POUR MODULE DE BATTERIE

Publication  
**EP 4106097 A4 20240904 (EN)**

Application  
**EP 21912313 A 20210430**

Priority  
CN 2021091384 W 20210430

Abstract (en)  
[origin: EP4106097A1] The present application relates to a battery module, comprising a first type of battery cells and a second type of battery cells electrically connected at least in series, wherein the first type of battery cells and the second type of battery cells are battery cells with different chemical systems, the first type of battery cells comprises N first battery cells, and the second type of battery cells comprises M second battery cells, where N and M are integers of no less than 1; and the first battery cells and the second battery cells at least satisfy the following relationships: (1)  $S1 \times CD1 \leq S2 \times CD2$ ; (2)  $4.5 \times 10^{3\leq} \leq S1 \times C1 \leq 3.6 \times 10^{4\leq}$ , in  $Ah \cdot W^{\circ}C/(g \cdot L)$ ; and (3)  $3 \times 10^{4\leq} \leq S2 \times CD2 \leq 8.5 \times 10^{5\leq}$ , in  $Ah \cdot W^{\circ}C/(g \cdot L)$ ; where S1 is a DSC heat release of a positive electrode plate of the first battery cell per unit mass in a nitrogen atmosphere and a range of from 50°C to 500°C, in  $W^{\circ}C/g$ ; S2 is a DSC heat release of a positive electrode plate of the second battery cell per unit mass in a nitrogen atmosphere and a range of from 50°C to 500°C, in  $W^{\circ}C/g$ ; and CD1 and CD2 are respectively unit volume capacities of the first battery cell and the second battery cell, in  $Ah/L$ .

IPC 8 full level  
**H01M 4/131** (2010.01); **H01M 4/136** (2010.01); **H01M 4/505** (2010.01); **H01M 4/525** (2010.01); **H01M 4/58** (2010.01); **H01M 10/0525** (2010.01); **H01M 16/00** (2006.01); **H01M 50/204** (2021.01); **H01M 4/02** (2006.01); **H01M 10/42** (2006.01)

CPC (source: EP US)  
**H01M 4/131** (2013.01 - EP); **H01M 4/136** (2013.01 - EP); **H01M 4/505** (2013.01 - EP US); **H01M 4/525** (2013.01 - EP US); **H01M 4/5825** (2013.01 - EP); **H01M 10/0525** (2013.01 - EP); **H01M 10/4207** (2013.01 - US); **H01M 16/00** (2013.01 - EP); **H01M 50/133** (2021.01 - US); **H01M 50/204** (2021.01 - EP US); **H01M 10/0525** (2013.01 - US); **H01M 10/4235** (2013.01 - EP); **H01M 2004/021** (2013.01 - EP); **Y02E 60/10** (2013.01 - EP)

Citation (search report)

- [X] CN 112599932 A 20210402 - WEILAI AUTOMOBILE TECH ANHUI CO LTD & EP 4027444 A1 20220713 - NIO TECH ANHUI CO LTD [CN]
- [X] CN 208674305 U 20190329 - DONGGUAN TAFEL NEW ENERGY TECH CO LTD, et al
- [T] PENGJIE LIU: "Understanding the influence of the confined cabinet on thermal runaway of large format batteries with different chemistries: A comparison and safety assessment study", JOURNAL OF ENERGY STORAGE, vol. 74, 31 October 2023 (2023-10-31), NL, pages 109337, XP093152454, ISSN: 2352-152X, DOI: 10.1016/j.est.2023.109337
- See also references of WO 2022226974A1

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**EP 4106097 A1 20221221**; **EP 4106097 A4 20240904**; CN 115552712 A 20221230; CN 115552712 B 20240906; US 2023048691 A1 20230216; WO 2022226974 A1 20221103

DOCDB simple family (application)  
**EP 21912313 A 20210430**; CN 2021091384 W 20210430; CN 202180032325 A 20210430; US 202217963368 A 20221011